SONY

3-752-315-21(3)

Integrated AV Amplifier

Operating Instruction

[redacted]

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WARNING

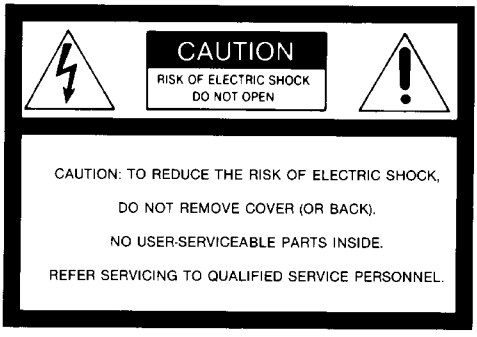
OWNER'S RECORD

The model and serial numbers are located at the rear. Record these numbers in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. _____ Serial No. _____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

INFORMATION

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move the equipment way from the receiver
Plug the equipment into different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/televison technician for additional suggestions. The user may find the following booklet prepared by the Federal communications commission helpful.
"How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

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Overview

This AV amplifier has 5 power amplifiers. You can enjoy various audio and video program sources with this unit.

5 high power amplifiers
To enjoy surround sound system easily, the unit incorporates two 120-W (70-W for U.S.A. model) amplifiers for front speakers, one 120-W (70-W for U.S.A. model) amplifier for center speaker(s), and two 40-W (30-W for U.S.A. model) amplifiers for rear speakers.

Spontaneous twin drive power circuit
Condensers having large capacity are used for the voltage amplification drive stage of class A and power output stage of class B. Thus, a stable output and high quality sound are obtained, resulting in exclusion of power interferences. The class A stage realizes a stable operation free from interference of the power stage even when an instantaneous or strong output is received.

Super legato linear system
The power amplifier drives low impedance speakers and assures powerful reproduction without low crossover distortion and switching distortion over the wide range.

Gibraltar chassis
A hard chassis named "Gibraltar" which provides high rigidity and periodic damping characteristics, is employed to reduce distortion caused by vibrations. This reduced air vibrations caused by floor and speakers and also reduces vibrations caused by the power transformer and power transistors.

Digital surround sound system
This amplifier is equipped with a Digital Signal Processor. All of 5 types of surround effect—DOLBY SURROUND*, THEATER, HALL, JAZZ CLUB, and STADIUM have been preset. (Refer to page 26.)

Automatic input balance adjusting system
This amplifier can automatically adjust the input balance on the DOLBY and THEATER surround mode.

Tone control system for the surround speakers
You can compensate the tone of the surround sounds from front speakers, center speaker(s), and rear speakers independently.

Video and audio control center
- You can control up to 7 video sources—VCRs, a Laser disc player, and a TV (BS) tuner.
- You can combine a video image with sound from another program source using the "MIX" function. (Refer to page 22.)
- You can label to the input selector as you desire. (Refer to page 23.)

Source direct button
A source direct button is employed to reproduce high fidelity sound. Any source can be reproduced without passing through the circuits of surround sound system, tone control, and balance control.

Programmable remote commander RM-P651
The supplied remote commander can "learn" the various functions of other infrared type remote commanders.

* Manufactured under licence from Dolby Laboratories Licensing Corporation. Additionally licensed under one or more of the following patents: U.S. numbers 3,632,886, 3,746,792 and 3,959,590; Canadian numbers 1,004,603 and 1,037,877.
"DOLBY" and the double-D symbol ⧈ are trademarks of Dolby Laboratories Licensing Corporation.

Precautions

On safety

- Before connecting the unit to an AC outlet, be sure that the operating voltage of your unit is identical with that of your local power supply.
- Should any solid object or liquid fall into the unit, unplug it and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the cord itself.

On operation

Before making program source connections, be sure to turn the power switch off and unplug the unit.

On cleaning the cabinet

Clean the cabinet, panel and controls with a soft cloth lightly moistened with mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

Special note

When the unit is first set up, when the unit has been unplug for a long period, or when the microprocessor has been affected by accidental noise, the microprocessor may not operate correctly and the operating function is not displayed correctly in the display.
After setting the POWER switch to off, turn on the POWER switch while pressing the SET button. The microprocessor in the unit is reset to initial condition.

For the customers in the U.S.A.

For detailed safety precautions, see the leaflet "IMPORTANT SAFEGUARDS".

If you have any question or problem concerning your unit, please consult your nearest Sony dealer.

Unpacking

Choosing a Good Location

To prevent internal heat buildup in the unit,
place the unit in a location with adequate air circulation.

Do not install the unit:

- near heat sources such as radiators or air ducts.
- in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.

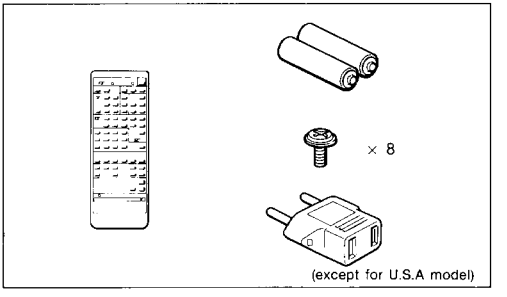
Do not place anything on top of the cabinet.
The top ventilation holes must be unobstructed for the proper operation of the unit and to prolong the life of its components.

Do not throw away the carton and packing material!
It will be an ideal container when transporting the unit for repair work, etc.

Checking the Supplied Accessories

After unpacking, check the following accessories are included.

- Remote commander RM-P651 .....(1)
- Sony batteries SUM-3 (NS).....(2)
- Screws .....(8)
- AC plug adapter (except for U.S.A. model).....(1)



Removing the Side Panels

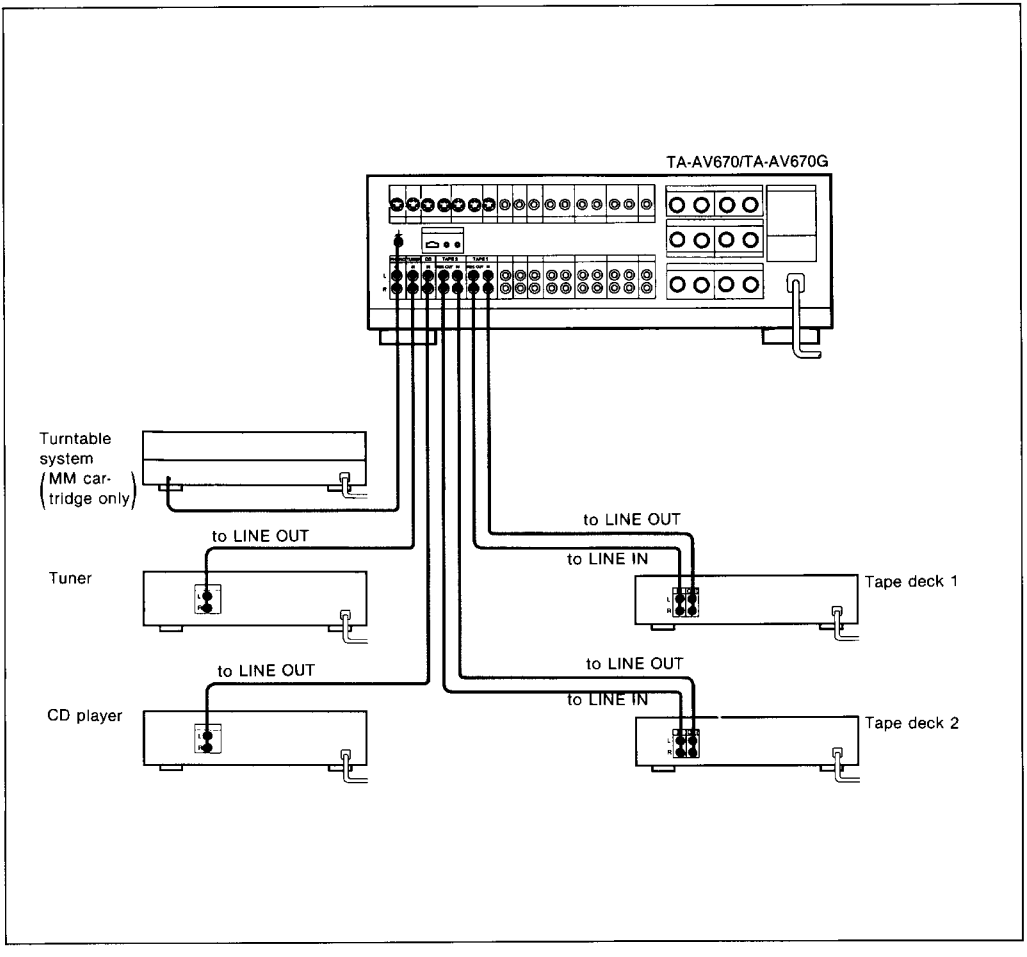
You can remove the side panels. When you remove the panels, fix the cabinet with the short screws supplied instead of the screws that were removed. Do not use screws other than those supplied, since doing so might damage the internal circuit boards.
For your safety, disconnect the AC power cord from the wall outlet before proceeding.

Hooking Up the System

At first, this section describes the connections with the other audio/video equipments and speakers. After that it also shows about the remote control system and AC outlet.

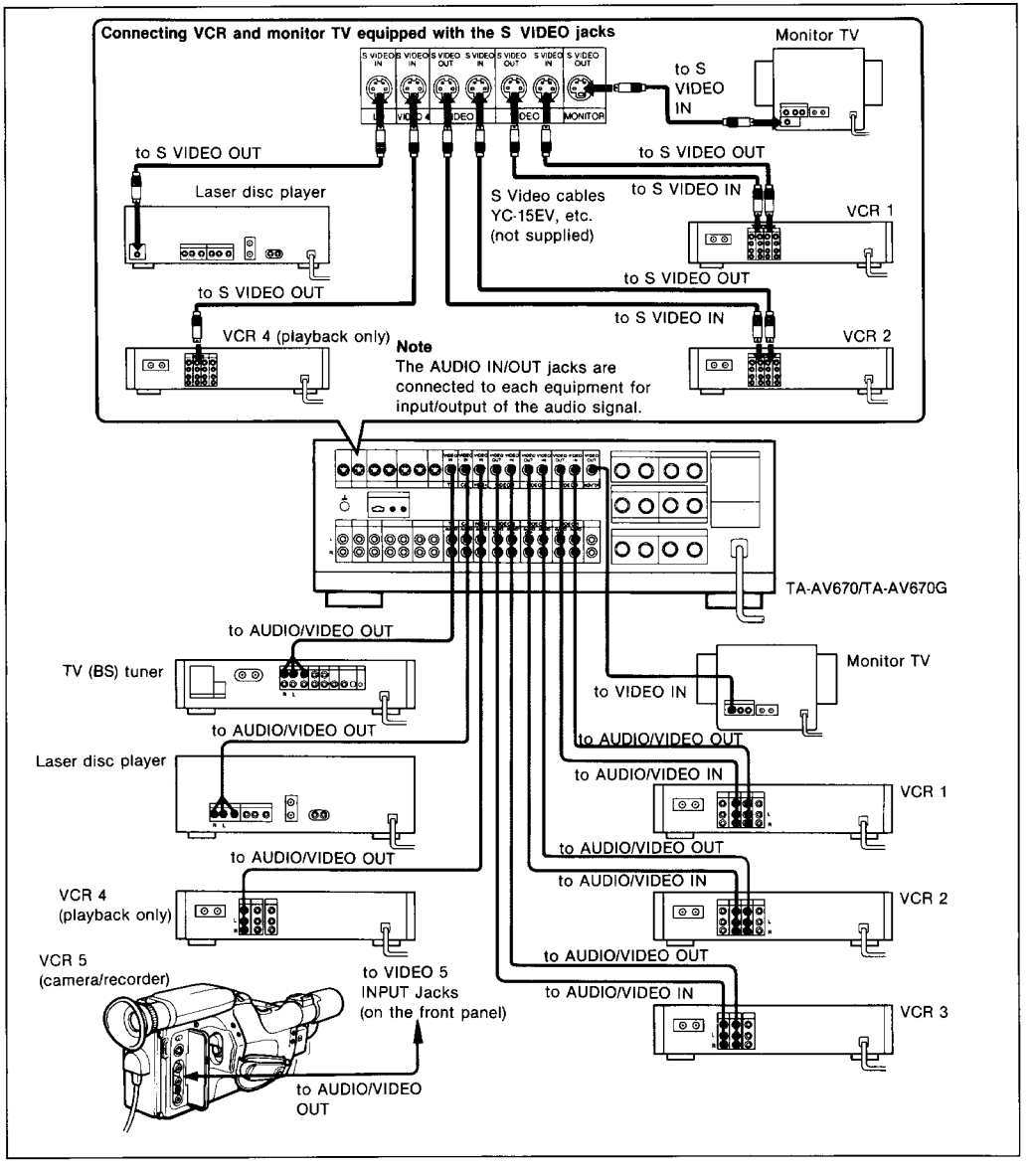
- Connect the AC power cord last.
- Jacks and plugs of the connection cord are color-coded as follows:
  Red jacks and plugs: For the right channel of audio signals
  White jacks and plugs: For the left channel of audio signals
  Yellow jacks and plugs: For video signals
- The cable connectors should be fully inserted into the jacks. Loose connections may cause hum and noise, or make the remote commander operation impossible.

Connecting Audio Equipment



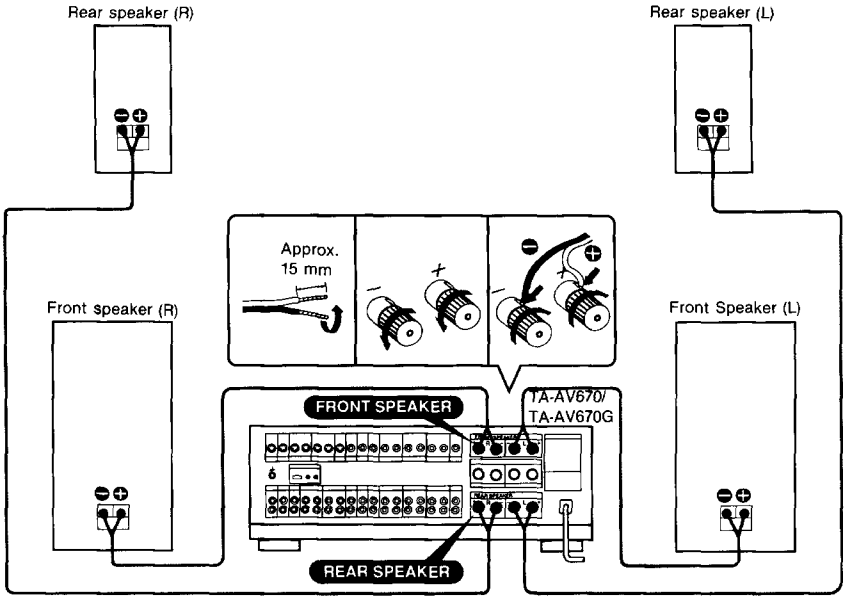
Connecting Video Equipment

The S VIDEO circuitry and the VIDEO circuitry of this unit are independent of each other. The signals input from the S VIDEO jacks are not output to the VIDEO jacks, and the signals input from the VIDEO jacks are not output to the S VIDEO jacks. Therefore, video dubbing is only possible between the S VIDEO jacks or between the VIDEO jacks.



Hooking Up the System

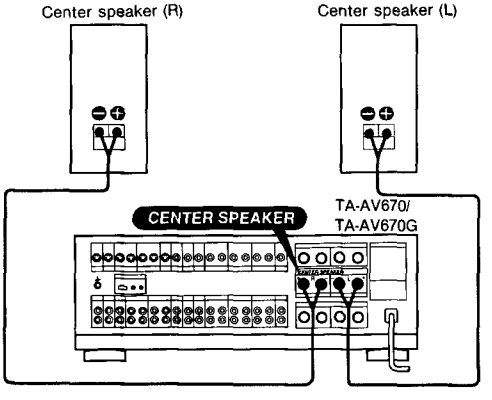
Connecting Front and Rear Speakers



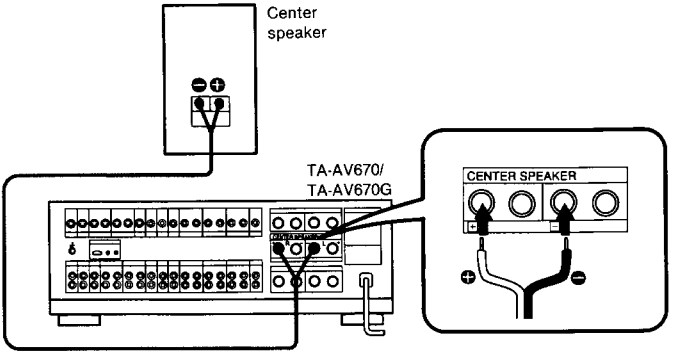
Connecting Center Speaker(s)

This unit can be connected to one or two center speakers or monitor TV for center speaker(s).

(A) When using two center speakers

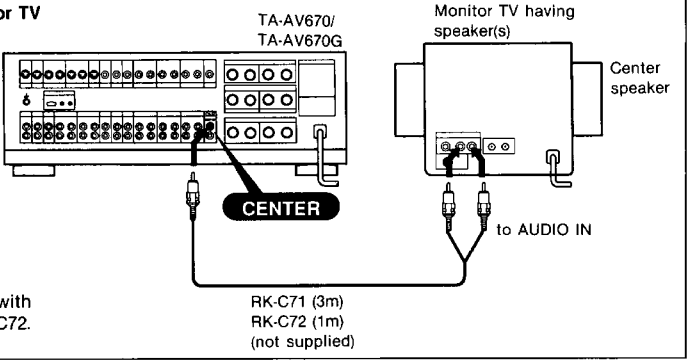


(B) When using one center speaker



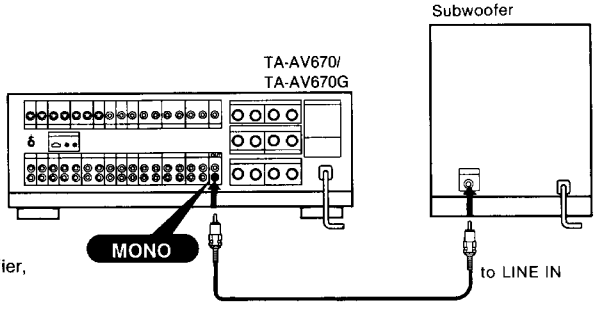
Note
Do not connect to TV's speaker.

(C) When using speaker(s) of monitor TV



Note
Use the connecting cord equipped with phono plugs like Sony RK-C71, RK-C72.

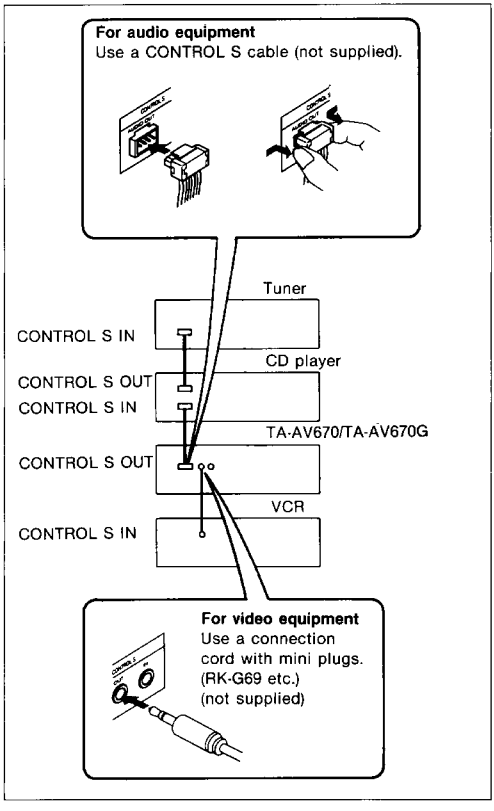
Connecting a Subwoofer



Note
When using subwoofer not having amplifier, connect through a monaural power amplifier.

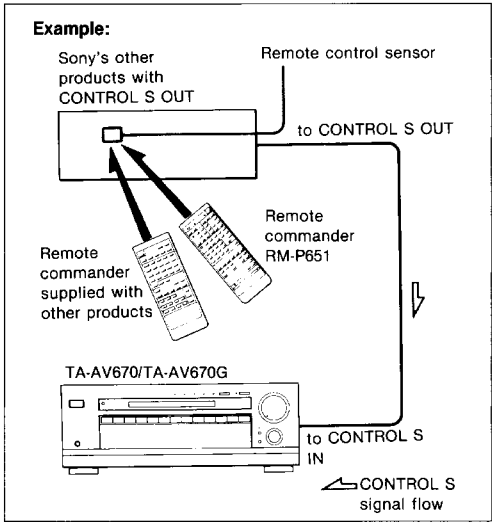
Connecting the Remote Control System

When you make the CONTROL S connections, you can remotely control the Sony products connected. For video connection, use a connecting cable RK-G69 (not supplied).



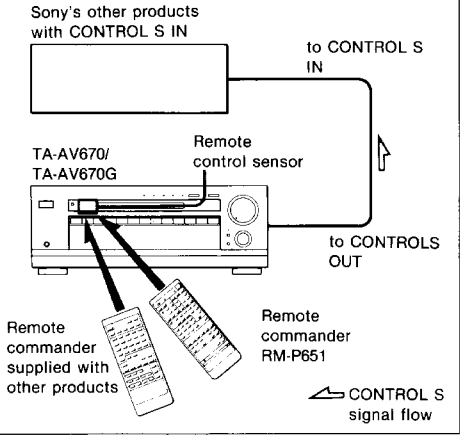
CONTROL S signal flow

To control this amplifier through other Sony products
If your audio and/or video products have CONTROL S OUT connector, make a connection as shown in the figure below. Point the remote commander supplied with this amplifier to the remote sensor of another product. You can remotely control this amplifier placed away from other products.

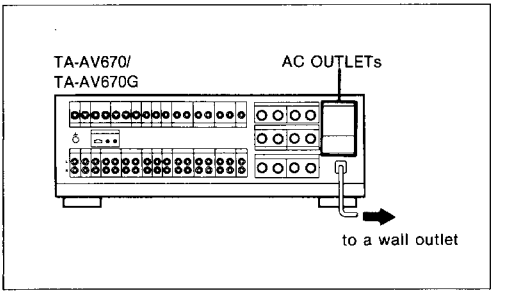


To control other Sony products through this amplifier
If your audio and/or video products have CONTROL S IN connector, make a connection as shown in the figure below. Point the remote commander supplied with your products to the remote sensor of this amplifier. You can remotely control other products placed away from this amplifier.

Example:


Sony's other products with CONTROL S IN
to CONTROL S IN
TA-AV670/ TA-AV670G
Remote control sensor
to CONTROLS OUT
Remote commander supplied with other products
Remote commander RM-P651
CONTROL S signal flow

Connecting the AC Power



Connect the AC power cord to the wall outlet last of all.

AC outlets are used to power other equipments whose total power consumption is less than the wattage indicated on the AC outlets.

SWITCHED: The outlets are controlled with the POWER switch.

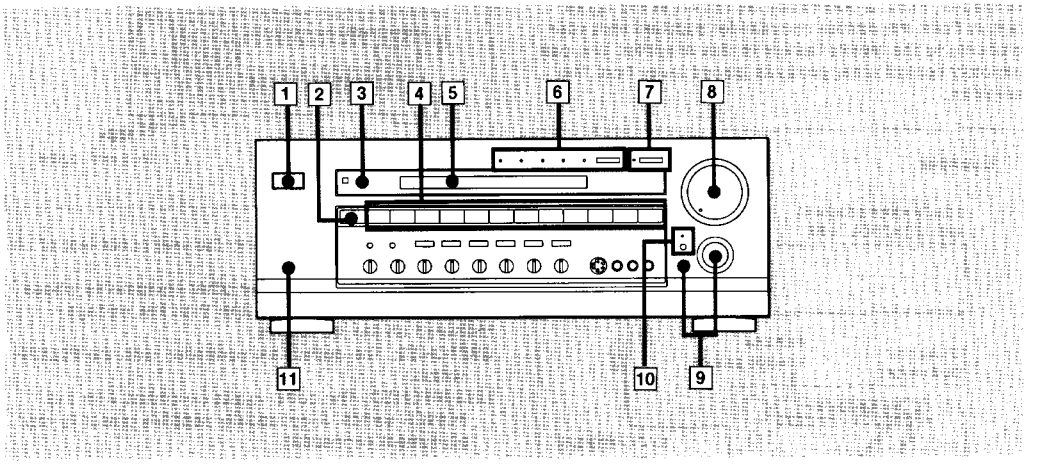
UNSWITCHED: The outlet is not controlled with the POWER switch. It continually supplies power to any equipment connected.

Caution
Do not connect electrical home appliance such as an electric iron, fan, or other high-wattage equipment to these AC outlets.

Functions of Controls

This section describes about such each name and function of this amplifier and remote commander. Please read carefully to operate these units correctly.

Front Panel



1 POWER switch
Press to turn on the unit. Press again to turn off.

2 MIX button
Press to combine a visual source and an audio source.
(Display changes as follows: VISUAL source→AUDIO source→off.)

3 Remote control sensor

4 Input selectors
Select the program source.

5 Display

6 SURROUND MODE selector and indicators
Selects the surround mode. To set the surround mode to off, press the selector so that no indicator lights up.
(Display and indicators changes as follows: DOLBY SURROUND → THEATER → HALL → JAZZ CLUB→STADIUM→off.)

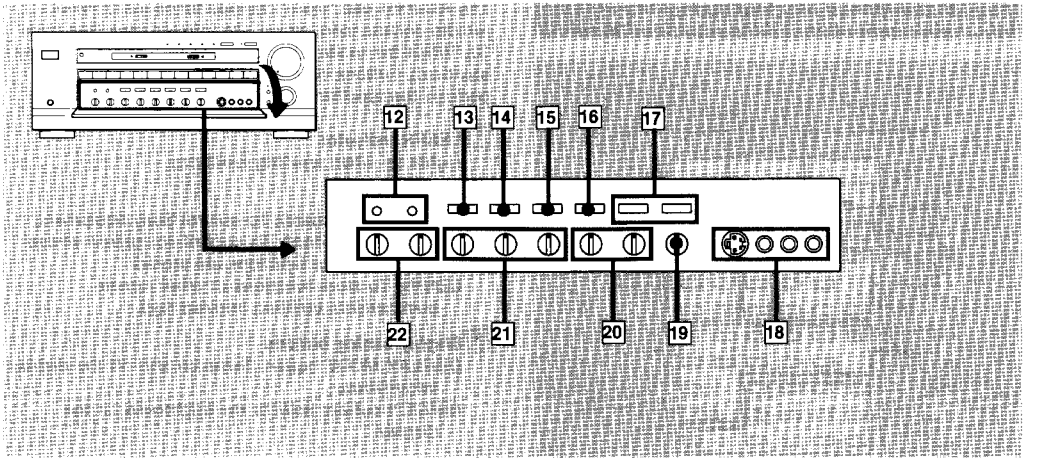
7 SOURCE DIRECT button and indicator
To enjoy more pure sound, press the button so that the indicator lights up. The sound signal of the program source are directly output to the power amplifier sections without passing through the surround processor, tone control, and balance control.

8 MASTER VOLUME control and indicator
Controls the sound volume. To increase the volume, turn the control clockwise. To decrease the volume, turn the control counterclockwise.
Note
Turn down the volume before switching on the unit. This prevents damage to speakers.

9 MODE button and ACOUSTIC control
Use these when adjusting volume of rear and center speakers, delay time, early reflection time, and effect level. Press the MODE button to select the parameter, and turn the ACOUSTIC control to adjust the parameter.

10 MUTING button and indicator
Press the button to mute the sound. Press again to resume the sound.

11 HEADPHONES jack
Accepts the stereo phone plug of headphones. The jack outputs the sound of front speakers only. To listen to the program source only with the headphones, set the FRONT/CENTER and REAR SPEAKERS buttons 12 to OFF (□).



12 SPEAKERS buttons
Normally set these SPEAKERS buttons to ON (▭).
FRONT/CENTER: Turns ON (▭) and OFF (□) the front and center speakers.
REAR: Turns ON (▭) and OFF (□) the rear speakers.

13 DISPLAY MODE button
Press the button to turn on and off the display information. When the display is turned off, if you press the other buttons or controls, all information appear on the display for about five seconds.

14 PRO LOGIC MODE button
Selects the speaker operation mode of Dolby Pro Logic function.
(Display changes as follows: PHANTOM → 3 CH LOGIC → CENTER OFF → NORMAL →WIDE.)

15 TEST TONE button
Turns on and off the test tone to adjust the balance among front, rear, and center speakers.

16 CHARACTER button
Labels to input selectors.

17 REC OUT buttons
SET: Sets the desired program source for recording while you listen to/watch another program soruce.
CHECK: Displays the program source set with the SET button.

18 VIDEO 5 INPUT jacks
Accept S-video, video, and audio signals.

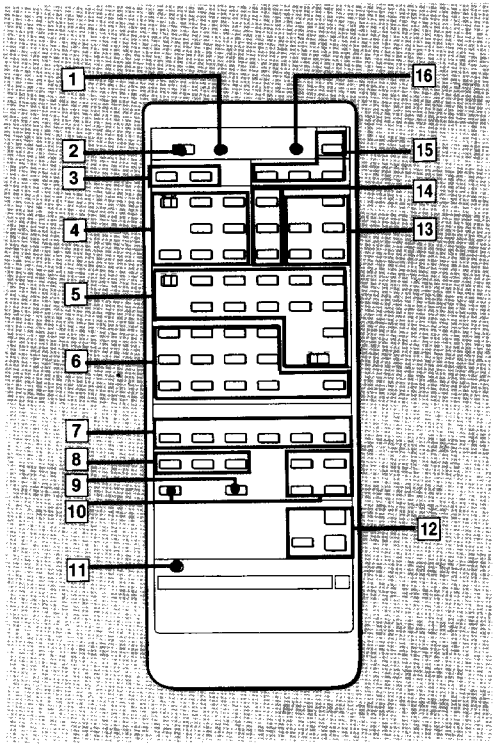
19 BALANCE control
Adjusts the balance of the right and left front speakers.

20 FRONT tone controls
Control the tone quality of the front speakers.
BASS: Adjusts bass sound.
TREBLE: Adjusts treble sound.

21 CENTER tone controls
Control the tone quality of the center speaker(s).
BASS: Adjusts bass sound.
MID: Adjusts middle sound.
TREBLE: Adjusts treble sound.

22 REAR tone controls
Control the tone quality of the REAR speakers.
BASS: Adjusts bass sound.
TREBLE: Adjusts treble sound.

Programmable Remote Commander RM-P651



The RM-P651 can "learn" various functions of other remote commanders which use infrared rays (see page 30). When the mode selector is set to SONY STD (Sony standard), buttons on the RM-P651 can be used to perform the functions below:

1 LEARN indicator
Lights up when learning functions.

2 MODE selector
SONY STD (standard): To control Sony equipment.
USER STD (standard): To control equipment whose remote control functions are stored.
LEARN: To store functions of other remote commanders emitting infrared rays.

3 Display setting buttons
DISPLAY MODE button: Turns on and off the display information.
DIMMER button: Selects the brightness on the display.

4 CD player/LD player control section
CDP/LDP selector: Selects CD player or LD (Laser disc) player to be played. The combined CD/LD player can be controlled with this selector set to LDP.
▶: Play
II: Pause
■: Stop
⏮/⏭: AMS (Automatic Music Sensor)
◀◀/▶▶: Manual search (only for Laser disc player)

5 Tape deck/VTR control section
TAPE/VTR selector: Selects tape deck or VCR to be controlled.
▶: Play
II: Pause
■: Stop
◀◀: Rewind
▶▶: Fast forward
● REC: Recording (Press both ● REC button and the right button for recording.)

Following buttons can be used when the TAPE/VTR selector is set to VTR.
DUAL button: Selects bilingual programs.
ANT (antenna) TV/VTR button: Selects the output signal from the antenna terminal on the VCR, eigher a TV signal or VCR programs.
CH (channel) + / − buttons: Select channel on the VTR.
VTR 1, 2, and 3 selector: Selects VCR type.
1: Betamax VCRs
2: 8 mm VCRs
3: VHS VCRs

6 **Input selectors**
VIDEO 1-5, LD, TV, TAPE 1-2, CD, TUNER, PHONO buttons: Selects program sources.
MIX button: Combines a visual source and an audio source.

7 **SURROUND MODE (ON/OFF, DOLBY, THEATER, HALL JAZZ CLUB, STADIUM) selectors:**
Selects the surround mode.

8 **MODE button and ACOUSTIC CONTROL buttons**
MODE button: Selects the parameter.
ACOUSTIC CONTROL buttons: Adjust the parameter.

9 **SOURCE DIRECT button**
Bypasses the circuits of surround processor, tone control, and balance control.

10 **Volume level controls of center and rear speakers**
TEST TONE buttons: Turns on and off the test tone.
CENTER VOL +/– buttons: Adjust the volume level of the center speaker(s).
REAR VOL +/– buttons: Adjust the volume level of the rear speakers.

11 **RESET button**
Reset the commander to the initial state.

12 **Master volume and muting buttons**
MASTER VOL +/– buttons: Adjust the sound level from SPEAKERS and HEADPHONES.
MUTING button: Mutes the output signal.

13 **TV control section**
TV/VIDEO button: Selects the input signal of the TV.
CH +/– buttons: Select a preset channel.
VOL +/– buttons: Control the TV volume.

14 **Tuner control section**
BAND button: Selects the frequency band.
PRESET +/– buttons: Selects higher or lower preset number.

15 **POWER buttons**
POWER: Turns on/off this amplifier and the equipment connecting to the SWITCHED AC OUTLETs.
LDP POWER: Turns on and off the Laser disc player.
VTR POWER: Turns on and off the selected by the VTR 1,2,3 selector (usable only when the TAPE/VTR selector is set to VTR).
TV POWER: Turns on and off the TV.

16 **PROGRAM CLEAR button**
Clears the stored signals.

Inserting the Batteries into the Remote Commander

1 **Open the cover.**

2 **Insert two size AA (R6) batteries with correct polarity.**

Battery life
About half a year of normal operation can be expected when using the Sony SUM-3 (NS) batteries.
When the batteries are exhausted, the commander can no longer operate the unit. Replace both batteries with new ones.

To avoid battery leakage
When the commander is not to be used for a long period of time, remove the batteries to avoid damage caused by battery leakage and corrosion.

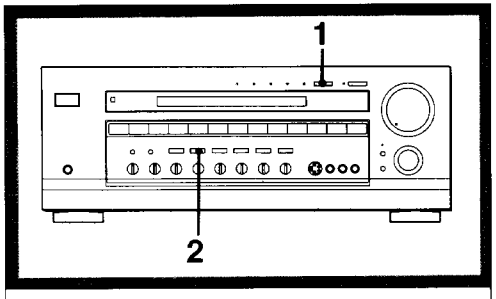
Getting Ready to Enjoy Surround Sound

The quality of surround sound depends on where you place the speakers.
This section describes the efficient placement of the speakers; then, explains how to adjust the speaker volume on each speaker and delay time of the rear speakers in Dolby surround mode.

Placement of the Speakers and Selecting the Dolby Pro Logic Mode

Where you place the speakers depends on the size and acoustics of the room where the system is to be installed. The examples shown in the following columns only represent typical cases. We recommend you experiment to find the speaker direction and arrangement that gives the most effective acoustics. Once you have arranged the speakers, in order to achieve the best sound distribution, you need to select the Dolby Pro Logic mode according to the type, size, and position of your speakers.

How to select the Dolby Pro Logic mode
After setting up the speakers for the best sound (see pages 16-17), select the Pro Logic mode for the best sound distribution. See the following pages for explanations of each setting.

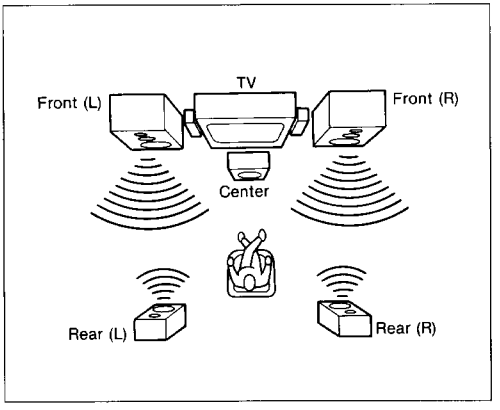


1 **Press SURROND MODE to select DOLBY or THEATER mode.**

2 **Press PRO LOGIC MODE to select the mode according to your types of speaker and arrangement.**
Each time you press PRO LOGIC MODE, the display changes as follows:

→ PHANTOM → 3CH LOGIC → CENTER OFF →
WIDE ← NORMAL

When you are using five or six speakers
Two front speakers, two rear speakers and one or two center speakers provide the best Dolby Pro Logic surround sound as well as make the most of this amplifier.
When you use two center speakers, place them beside the TV, so that the vocal image will be located at the center.

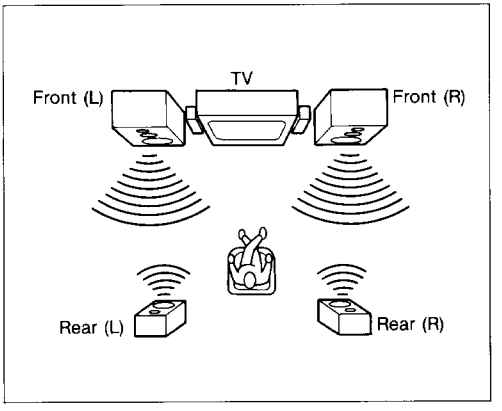


According to the size of the center speaker(s), set PRO LOGIC mode to NORMAL or WIDE.

NORMAL: Select this mode when you are using a small center speaker(s). With this setting, bass sound is distributed to the left and right front speakers equally because the small center speaker(s) cannot produce enough bass.

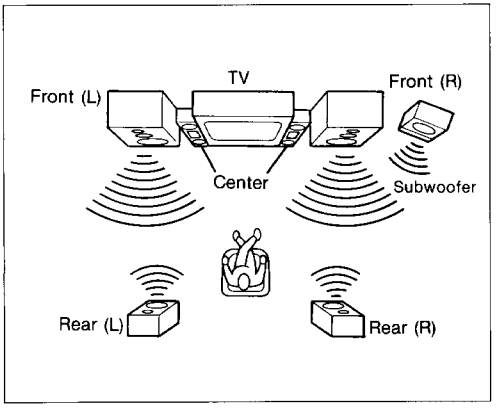
WIDE: Select this mode when you are using medium sized or large center speaker(s).

When you are using four speakers
Two front speakers and two rear speakers are used.



Set PRO LOGIC mode to PHANTOM.
PHANTOM: At this setting, the center channel sound is distributed to the left and right front speakers equally since a center speaker is not used.

Other cases
- When using only three speakers (two front speakers and one center speaker), set PRO LOGIC mode to 3CH LOGIC.
  3CH LOGIC: Rear channel sound will be heard from the two front speakers.
- A subwoofer speaker can be added to obtain a richer bass sound. Position the subwoofer speaker anywhere forward of your primary listening position. A deep bass sound is not as directional as the higher frequencies and therefore will not affect the stereo image.



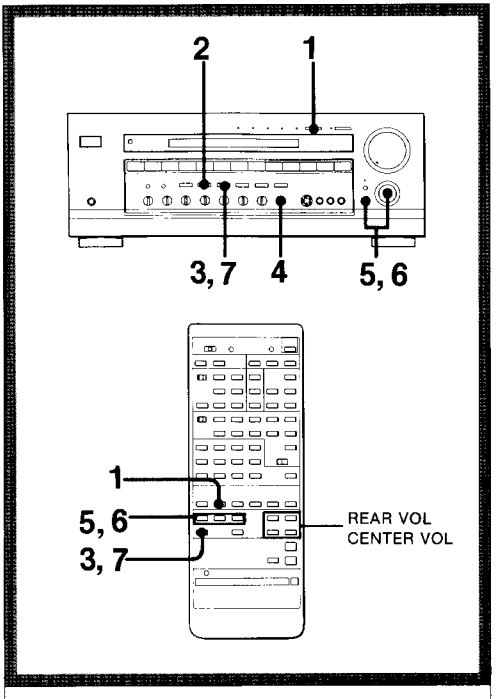
- **CENTER OFF** mode is only used for checking the input balance in Dolby surround mode. Center channel sound, such as voice or vocal, is not heard from the speakers.

Automatic Input Balance (Only for DOLBY and THEATER modes)

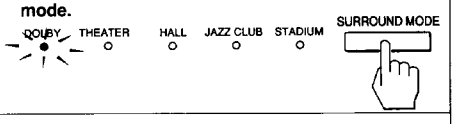
When playing back a Dolby surround processed video tape or video disc, the input level and input balance must be adjusted to obtain the best surround effect. On this amplifier, the input balance is automatically adjusted.

Adjusting the Volume Level of the Speakers —System with Center Speaker (s)

To enjoy the highest quality surround sound, adjust the front, center and rear speakers to the same volume level. The adjustment must be done with a test tone in Dolby Surround mode, but the level once adjusted can be used for all surround modes.
You can adjust the volume level from your listening position when you use the remote commander. The following explains the adjustments according to how you have arranged your speakers.

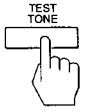


1 **Press SURRROUND MODE to select DOLBY mode.**

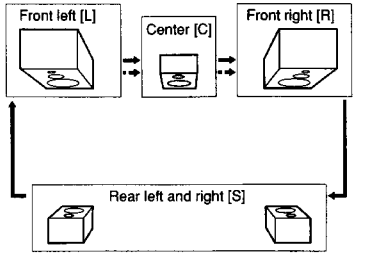


2 **Make sure that the PRO LOGIC MODE is set to NORMAL or WIDE.**

3 **Press TEST TONE.**

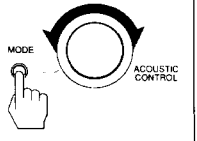


The test tone outputs from the left front [L], center [C], right front [R], and rear speakers [S] in succession.

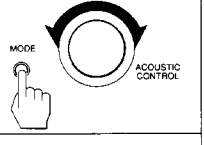


4 **Turn BALANCE to adjust the volume level of the left and right front speakers.**

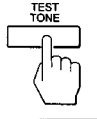
5 **Press MODE to display [Center □□ dB].**
Turn ACOUSTIC CONTROL to adjust the volume level of the center speakers so that it will be the same as the front speakers. (It can be adjusted with the CENTER VOL buttons on the remote commander.)



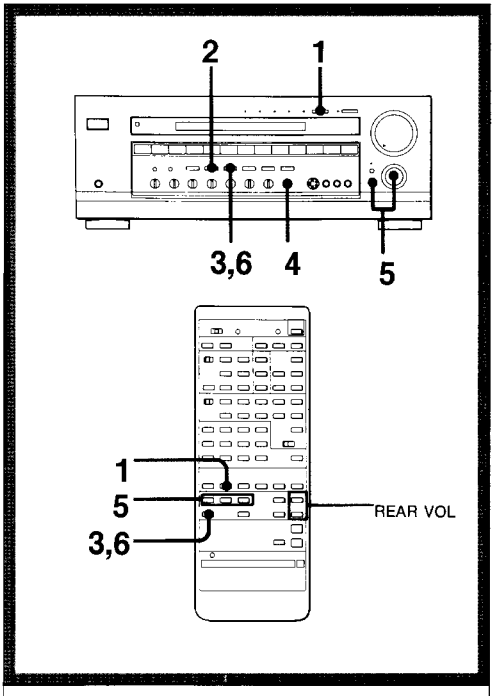
6 **Press MODE to display [Rear L □□ dB] or [Rear R □□ dB].**
Turn ACOUSTIC CONTROL to adjust the volume level of the left and right rear speakers so that they will be the same as the front speakers respectively.
(The volume levels of both channels can be simultaneously adjusted with the REAR VOL buttons on the remote commander.)



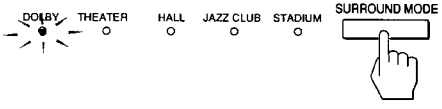
7 **Press TEST TONE.**
The test tone goes off.



Adjusting the Volume Level of the Speakers —System without Center Speaker(s)

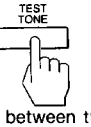


1 **Press SURROUND MODE to select DOLBY mode.**

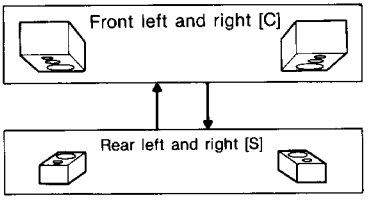


2 **Make sure that PRO LOGIC MODE is set to PHANTOM.**

3 **Press TEST TONE.**

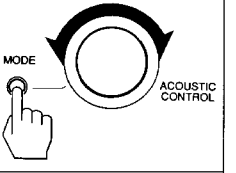


The test tone alternates between the front speakers [C] and rear speakers [S].



4 **Turn BALANCE to adjust the volume level of the left and right front speakers.**

5 **Press MODE to display [Rear L □□ dB] or [Rear R □□ dB].**
TURN ACOUSTIC CONTROL to adjust the volume level of the left and right rear speakers so that they will be the same as the front speakers respectively.
(The volume levels of both channels can be simultaneously adjusted with the REAR VOL buttons on the remote commander.)



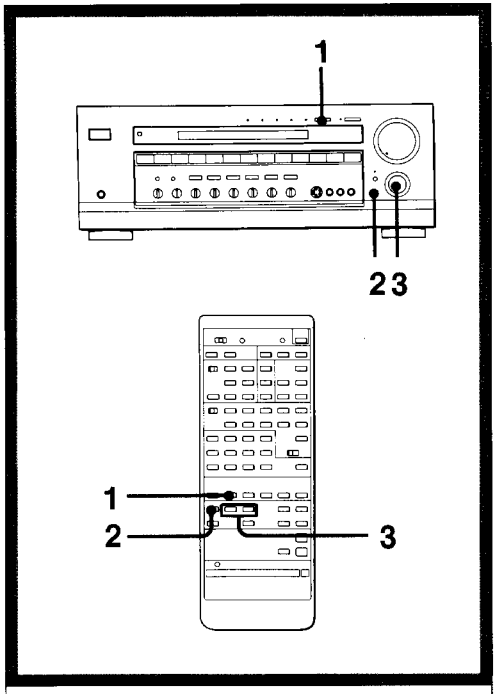
6 **Press TEST TONE.**
The test tone goes off.

When not using rear speakers

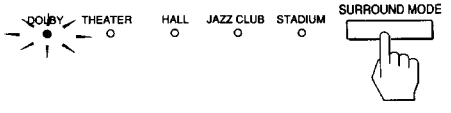
Set Pro Logic mode to 3CH LOGIC. Press TEST TONE to output test tone from the left front [L], center [C], and right front [R] speakers in succession.

Adjusting the Delay Time of the Rear Speakers (Only for DOLBY Surround Mode)

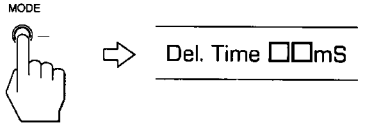
The delay time is a time difference between the sound from the front speakers (as direct sound) and that from rear speakers (as reflected sound). The delay time is adjustable from 15 ms to 30 ms. When setting the rear speakers in a large room or apart from your listening position, set the delay time shorter.



1 **Press SURROUND MODE to select DOLBY mode.**



2 **Press MODE to display the delay time mode.**



3 **Turn ACOUSTIC CONTROL to adjust the delay time of the rear speakers.**

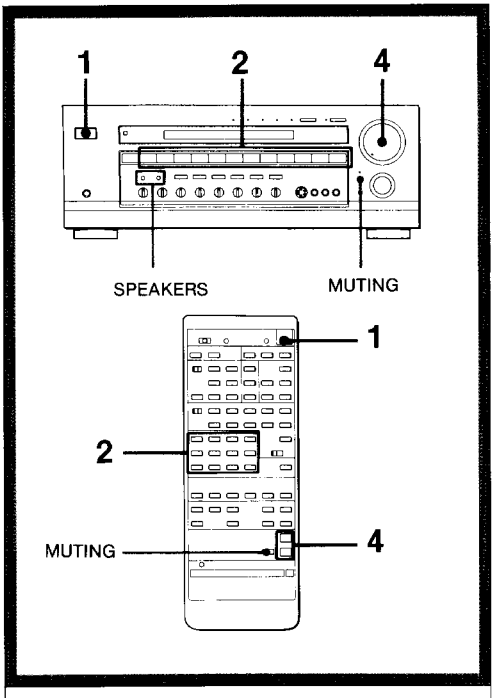
Note
Adjusting the delay time of the rear speakers is available for the Dolby surround processed source.

Listening to/Watching Program Sources

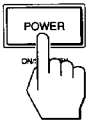
This section describes the basic playback operation, combining the video image with the sound from another program source and then putting your own label on input selectors.

Basic Operation

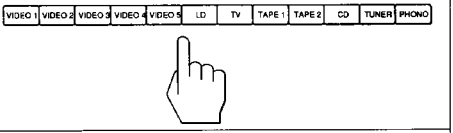
Before you begin, be sure to:
—Turn on the connected audio/video equipment.
—Set the SPEAKERS button to ON (⏏).



1 **Press POWER.**



2 **Select the program source.**



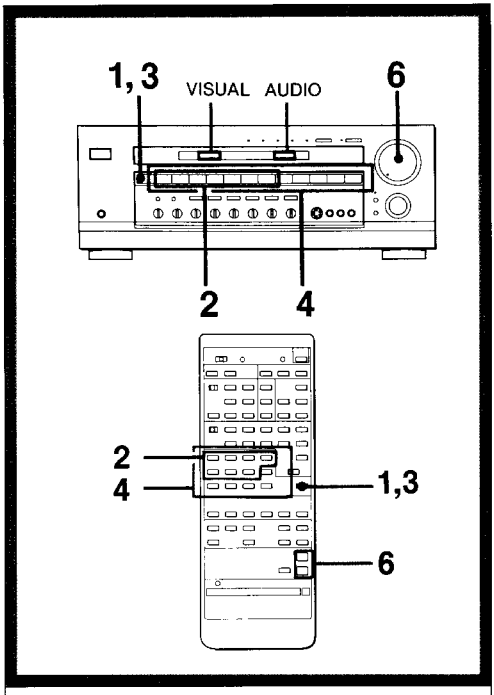
3 **Play back the selected program sources.**

4 **Adjust the volume level.**

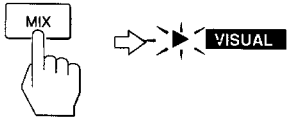
When the MUTING indicator has been lit up
Press MUTING to turn it off.

Combining the Video Image with the Sound from Another Program Source

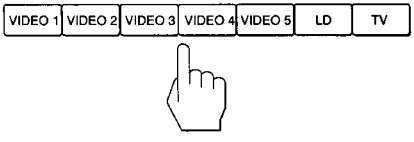
The MIX function allows you to combine a video image with sound from another program source as background music.



1 **Press MIX.**

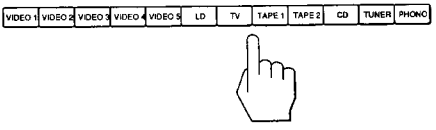


2 **Select the video source.**



3 **Press MIX**

4 **Select the audio source.**
The audio signal of video source can be also selected.



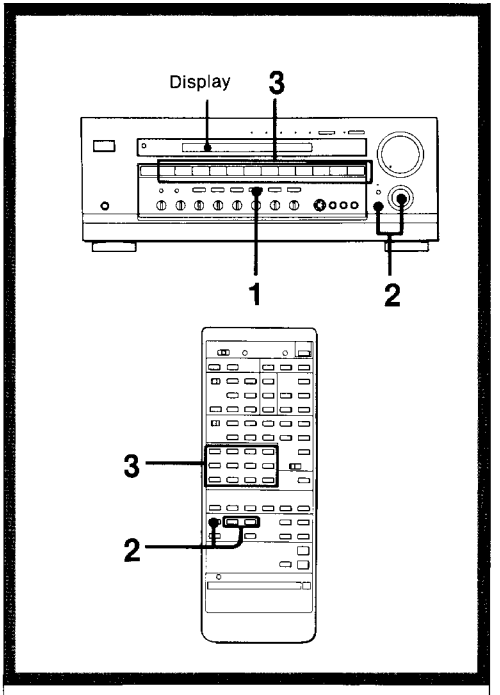
5 **Play back both the video and audio program sources.**

6 **Adjust the volume level.**

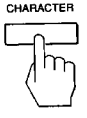
How to cancel the MIX function
Press MIX after step 4.
The mix function is cancelled and the audio and video signals of the selected video program source is output.

Putting Your Own Label on Input Selectors

You can put a label of up to 8 characters on an input selector. The label will appear in the display window when a selector is pressed.

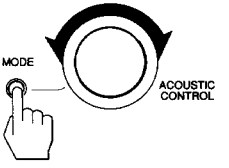


1 **Press CHARACTER.**



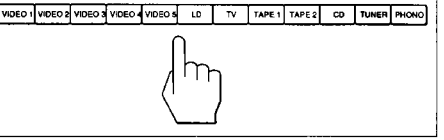
2 **Create a name.**
Three of video selectors may be labeled as VHS, Beta, and 8mm, for example.

1) Turn ACOUSTIC CONTROL to select a letter or number.
2) Press MODE to move the cursor.



Now, to resume the last name press the CHARACTER button again.

3 **Select an input selector to be labeled.**



To resume the original name of the input selector
Repeat steps 1 to 3 to input the original name.

If AC power cord is unplugged
The recorded labels are retained for approximately 2 weeks without AC power supply.

Usable letters and symbols

Space	!	→	#	←	%	&	'	(	)	*	+	,	−	.	/
0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
↑	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	II	_
↓	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
p	q	r	s	t	u	v	w	x	y	z					

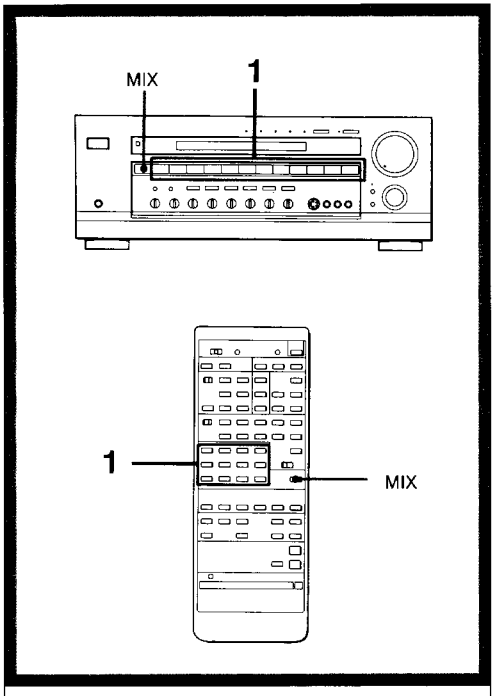
To resume the present name of the input selectors
1 Press POWER switch to turn off the unit.
2 While pressing SET button, press the POWER switch to turn on the unit. All seting data in the unit is reset to the factory settings.

Recording Audio/Video Program Sources

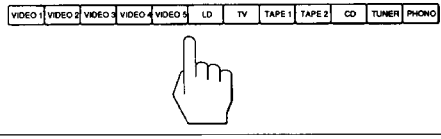
This section describes the basic recording and recording while listening to/watching another.

Basic Operation

You can operate two or more video or tape decks for recording at the same time as the audio (and video) signals of the program source is output simultaneously through all recording output jacks.



1 **Select the video or audio program source.**
If you want to combine video image and the sound from another audio source, press the MIX button to select them independently.
(See page 22.)

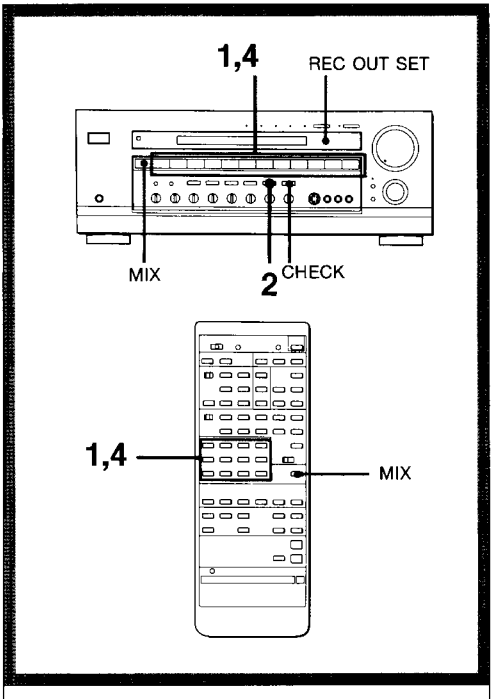


2 **Set the video or tape deck in the recording mode.**

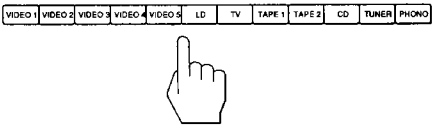
3 **Play back the selected program source.**

Recording Program Sources while Listening to/ Watching Another

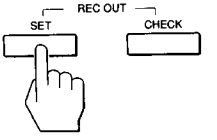
This unit has separate circuits for line output and/or recording, so you can record a program source while listening to/watching another.



1 **Select the program source to be recorded.**
If you want to combine a video image and the sound from another audio source, press the MIX button to select these sources independently. (See page 22).

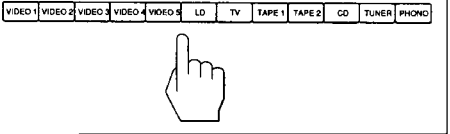


2 **Press SET.**



3 **Play back the selected program source(s) to be recorded and set the video or tape deck into the recording mode.**

4 **After checking that the REC OUT SET is indicated in the display, select the program source to be listened to/watched.**



5 **Play back the selected program source(s).**

To check the preset recording outputs
Press and hold the CHECK button to display them in the display window.

To record a listening program source
Press the SET button to go off the REC OUT SET indicator. The program source being listened to/watched is output from the REC OUT jacks.

Monitoring while recording
If a tape deck with 3-head system is connected, the recorded sound can be monitored. When the recording is done on the tape deck connected to the TAPE1 or TAPE2 jacks;

1 Press SET to set the rec out source.
2 Select TAPE 1 or TAPE2.

The recorded sound is immediately fed back to the amplifier and output to the speakers.

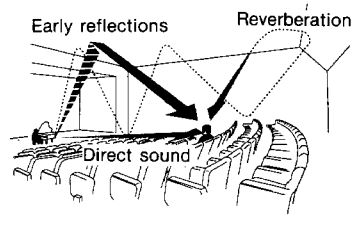
Enjoying the Surround Sound

This section describes the digital surround system, functions of the surround sound mode and the selecting the surround sound mode. It also shows the adjustable parameter and then how to adjust the tone quality of each speakers, the early reflection time and the effect level.

Understanding the Digital Surround System

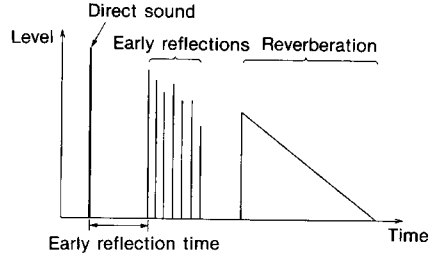
The sound heard in a place such as a concert hall or a movie theater consists of direct sound, an early reflected sound (early reflections) and a reverberative sound (reverberation). The acoustics of the room affects the way these three sounds are heard. We can estimate the size or the type of a hall by listening to an differentiating these three kinds of sound.
This amplifier reproduces the early reflections and the reverberation using its digital signal processor and allows you to design a variety of soundfields in your own room.

Types of the sound



The sound transition of the direct sound, early reflections and reberveration can be illustrated as below:

Transition of the sound



Note
Each surround mode has several internal (fixed) parameters in addition to the adjustable parameters explained in this section. Therefore, surround modes will not become the same even if you set all adjustable parameters in the same way.

Functions of the Surround Sound Modes

This amplifier incorporates Digital Signal Processor and Dolby Pro Logic Decoder. The digital signal processor electronically reproduces the five kinds of surround soundfield programs which have been preset in the factory as shown below. In the DOLBY and THEATER modes, speaker operation modes can be changed with the Dolby Pro Logic Decoder.
You can enjoy the digital surround sound effects easily by just selecting the surround mode according to the program source.

DOLBY mode (using Dolby Pro Logic function)
This mode is for reproducing the movie or sound program source processed with Dolby surround system on which the DOLBY SURROUND PRO LOGIC mark is labeled. You can hear dynamic sounds and natural voice just like listening to it in a movie theater or a concert hall.

THEATER mode (using Dolby Pro Logic function)
This mode is for reproducing the movie program source processed with the Dolby surround system. You can hear dynamic sound and natural voice just like listening to it in a movie theater. In this mode, reverberation effect is added to the signal processed through the Dolby Pro Logic Decoder.

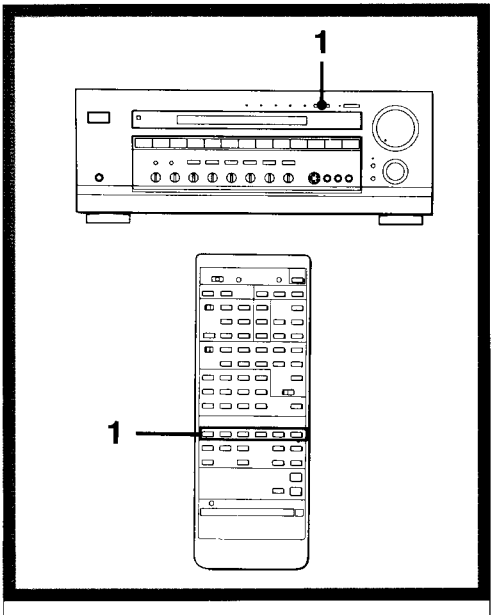
HALL mode
You can hear the naturaly acoustic sound having a reverberation effect that is produced in a medium sized concert hall.

JAZZ CLUB mode
You can hear the powerful and clear sound having an effect produced in a jazz club.

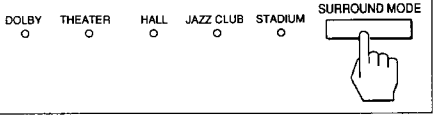
STADIUM mode
This mode is for adding the reverberation effect felt in an outdoor stadium to a program source recorded in studio.

Selecting the Surround Sound Mode

This amplifier has five surround modes, DOLBY, THEATER, HALL, JAZZ CLUB, and STADIUM, which have been preset in the factory. Since these are appropriate for the most types of music and listening situations, you can enjoy the digital surround sound effects by just selecting the surround modes according to the program source. You can also adjust several parameters to maximize the effect.



1 **Press SURROUND MODE to select your favorite surround mode.**



To resume the surround mode
Press the SURROUND MODE selector so that no indicator lights up. On using the remote commander, press the ON/OFF button in Surround Mode to turn off the indicator.

Adjustable Parameters

This amplifier reproduces the early reflections and the reverberation using its digital processor and allows you to design a variety of soundfields in your own room. This amplifier incorporates 5 types of surround modes, and within each mode, you can adjust several parameters to maximize the effect in your listening room.
Before adjusting parameters, play back the program source, and press SURROUND MODE selector to turn on the surround function. You can adjust parameters while listening to the actual sound.

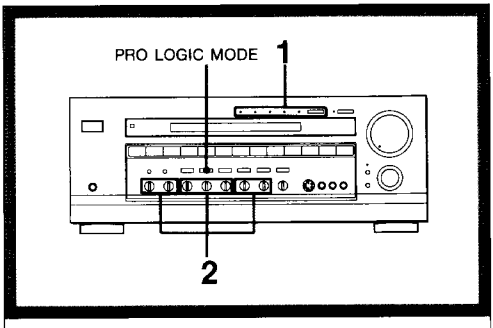
Parameter \ Surround Mode	DOLBY	THEATER	HALL	JAZZ CLUB	STADIUM
Rear Level	○*2	○*2	○	○	○
Center Level	○*1	○*1			
Early Reflection Time		○*2	○	○	○
Delay Time	○*2				
Effect Level		○	○	○	○

*1 except for PHANTOM mode
*2 except for 3CH LOGIC mode

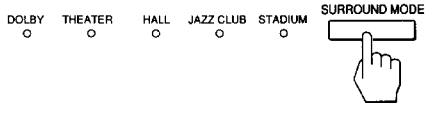
- Adjusting the rear level and center level is shown on pages 18 and 19.
- Adjusting the delay time is shown on page 20.
- The data of the early reflection time and delay time can be programmed into each surround mode individually. The data of the center, rear, and effect level are the same on all modes.

Adjusting the Tone Quality of Each Speakers

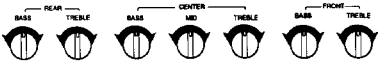
To enjoy the surround sound sufficiently, adjust the tone of the front, center, and rear speakers respectively to your preference.



1 **Press SURROUND MODE to select a surround mode.**

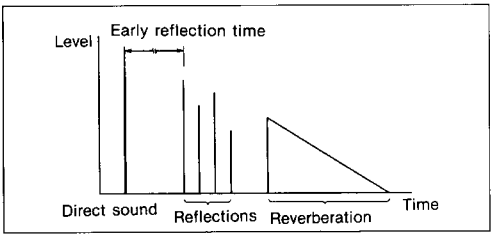


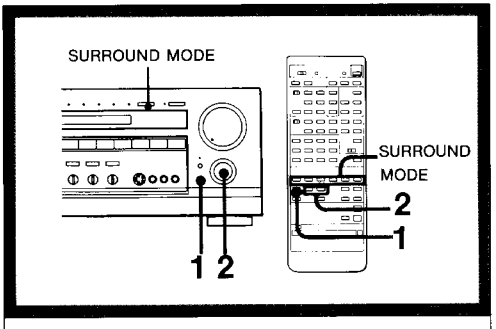
2 **Adjust the tone quality of each speakers.**



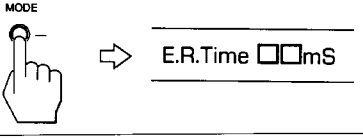
Adjusting the Early Reflection Time (Except for Dolby Surround Mode)

The early reflection time is the key parameter which determines the room size and listening position. Adjustment of this parameter will vary the time required for the sound to reach to the listening position. The longer the time, longer you will feel the distance to the origin of the sound.





1 **Press MODE.**



2 **Turn ACOUSTIC CONTROL to adjust the early reflection time.**

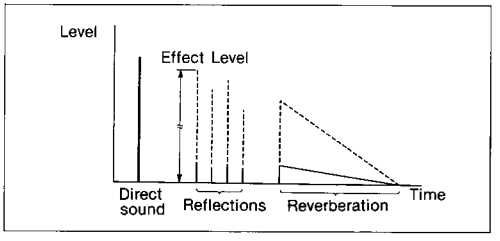
The early reflection time is adjustable from 0 ms to 51 ms on the THEATER or JAZZ CLUB mode, and from 0 ms to 90 ms on the HALL or STUDIUM mode.

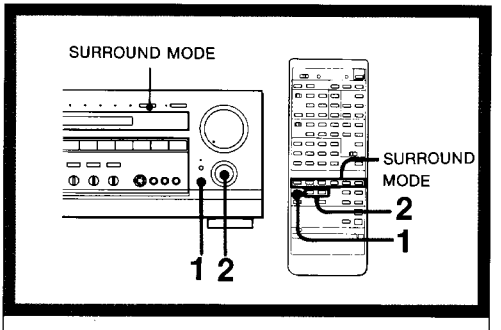
Note

When adjusting the parameter, noise may be output.

Adjusting the Effect Level (Except for Dolby Surround Mode)

This parameter adjusts the level of early reflections and reverberation. As the number gets larger, the room becomes more "live", and as it gets smaller, the room becomes "dead".





1 **Press MODE.**

⇨ Effect Level □□

2 **Turn ACOUSTIC CONTROL to adjust the effect level.**

The effect level is adjustable from 0 to 10 (100%) on the THEATER, HALL, JAZZ CLUB and STADUM modes.

Using the Remote Commander

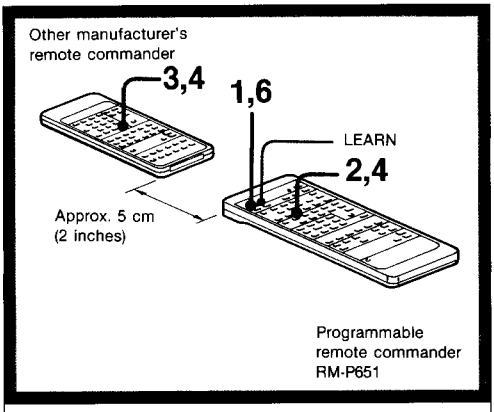
The RM-P651 can learn various functions of other remote commanders emitting infrared rays and allows you to control most of the audio and video equipment from a distance.

Programming Signals of Other Audio/Video Equipment with RM-P651

Insert batteries before operation.

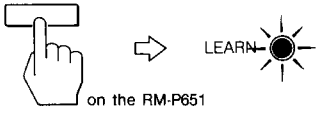
The two remote commanders must:
- be placed straight and head to head.
- be placed at a distance of approx. 5 cm (2 inches).
- not be moved during the programming operation.

How to program



1 **Set the mode selector to LEARN.**

2 **Press and hold the button which shall "learn" the remote-control signal until the LEARN indicator lights up.**

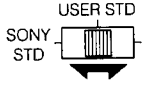


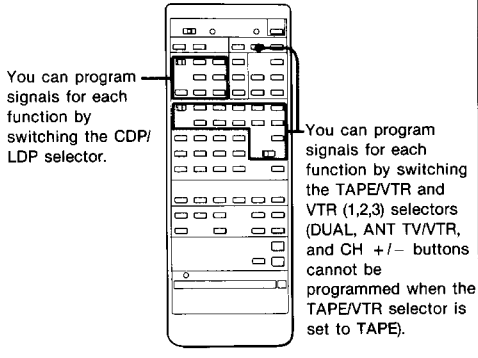
3 **Press and hold the button of other manufacturer's remote commander whose signal is to be learned.**

4 **Remove your finger(s) from the button(s) after the LEARN indicator goes off.**

5 **Repeat operation for each button to be programmed.**

6 **Set the mode selector to USER STD or SONY STD.**




You can program signals for each function by switching the CDP/ LDP selector.
You can program signals for each function by switching the TAPE/VTR and VTR (1,2,3) selectors (DUAL, ANT TV/VTR, and CH +/– buttons cannot be programmed when the TAPE/VTR selector is set to TAPE).

After programming
Be sure to test if the equipment really works with the programmed signals.

Number of signals that the commander can learn
It depends on the format of the signal. If you program signals of Sony equipment, approximately 90 signals can be programmed.

If the LEARN indicator flashes or does not go out in steps 2-4
The memory capacity has become full. This occurs when other signals stronger than the remote-control signals have been stored because the signals were programmed in a noisy environment or the remote commanders were placed too far apart from each other. In this case, clear all the signals following the procedure on the right and program from the beginning under the proper conditions again.

Notes on programming
- Remote-control signals of equipment of manufacturers other than Sony can be programmed only when they are compatible with the infrared wireless remote control system. Since the programmable commander can "learn" only the signals output from another remote commander, it cannot control equipment that does not use a remote commander. Also, note that there are some special remote-control signals that cannot be programmed.
- Do not attempt to use the programmable commander with an air conditioner or other household appliances.

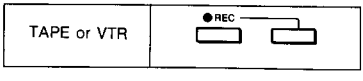
To Program a New Signal onto a Previously Programmed Button

Follow the programming procedure.
The previously programmed signal is cleared and replaced by the new signal.

To clear all programmed signals
1 Set the mode selector to LEARN.
2 Press and hold any button until the LEARN indicator lights up.
3 Press PROGRAM CLEAR until the LEARN indicator flashes and goes off.

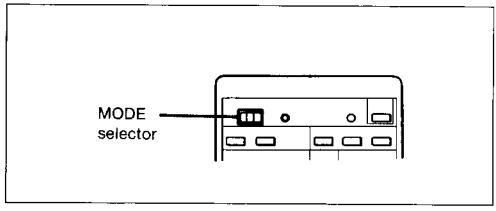
Note
It is not possible to clear the programmed content of just one button.

To program a signal onto the • REC button in the TAPE or VTR section
It is not possible to operate any equipment with only the REC button. To program a signal under the • REC button, press and hold the following buttons at the same time in step 2.

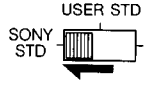


Controlling Equipment

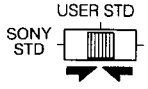
By switching the mode selector as shown below, a single button alternately controls Sony equipment and another manufacturer equipment.



To control Sony equipment



To control equipment with programmed signals



When Sony equipment cannot be remote-controlled
Program the signal in the same way as for equipment from other manufacturers. In this case, even with Sony equipment, set the mode selector to USER STD.

Notes on using the remote commander
- When you manipulate buttons on the commander, be sure to point the head of the commander toward the remote control sensor of the equipment.
- If there is an obstacle between the equipment and the head of the commander, the remote commander may not function.

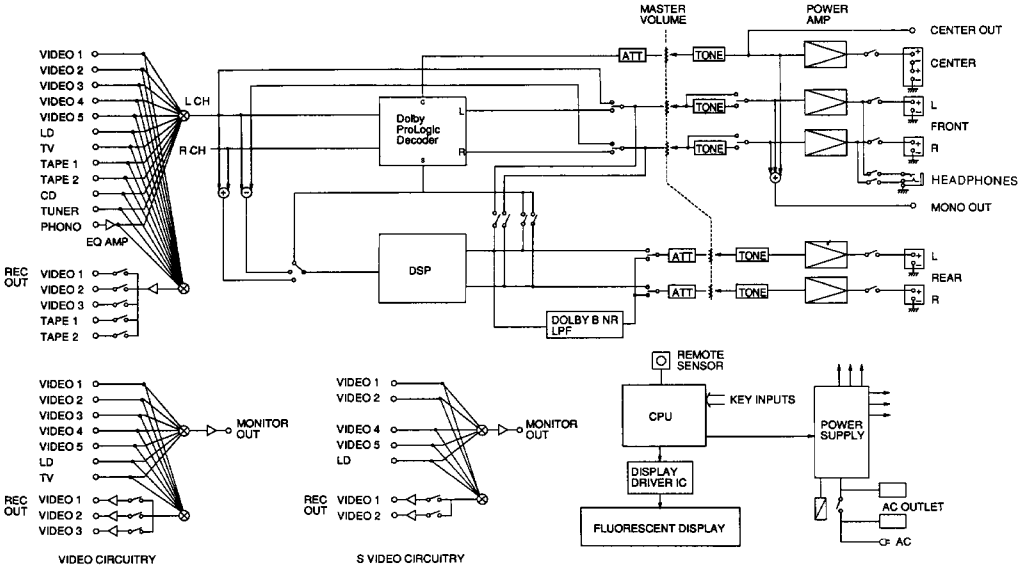
Notes on Battery
If the LEARN indicator does not light when a button is pressed, the batteries are almost exhausted.
When the batteries are exhausted, the remote commander can no longer operate the unit or programming becomes impossible.
If this happens, replace both batteries with new ones.
We recommend the use of alkaline batteries for prolonged use.

If no signal has been programmed
The programmable commander can control Sony equipment even when the mode selector is set to USER STD.

If the equipment works incorrectly
Press RESET.
The programmed contents of the buttons are not cleared by pressing RESET.

Block Diagram

This section consisely illustrates the functions and connecting order in the circuit composition.



Specifications (U.S.A. Model)

POWER OUTPUT AND TOTAL HARMONIC DISTORTION

With 8-ohm loads, both channels driven, from 20-20,000 Hz, rated 70 watts per channel minimum RMS power, with no more than 0.03% total harmonic distortion from 250 milliwatts to rated output.*

Other amplifier section

Continuous RMS power output (8 ohms)
Center: 70 W
Rear: 30 W + 30 W
Dynamic power output
Front: 120 W + 120 W (8 ohms, at 1 kHz IHF)
Harmonic distortion at rated output*
Less than 0.03%
Intermodulation (IM) distortion at rated output*
Less than 0.03%
Frequency response
PHONO: RIAA equalization curve ±0.5 dB
TUNER, CD TAPE 1, 2, VIDEO 1-5, LD, TV:
10 Hz — 100 kHz $^{+0}_{-3}$ dB
Residual noise* Less than 90 μV (A)
Damping factor 50 (8 ohms, at 1 kHz)
S/N TUNER, TAPE 1, 2, VIDEO 1-5, LD, TV:
92 dB(A)
PHONO: 76 dB (A)
(*Source direct: ON)

Video section

Input

Input jack		Sensitivity	Impedance
VIDEO	VIDEO 1, 2, 3, 4, 5, LD, TV	1 Vp-p	75 ohms
S-VIDEO	VIDEO 1, 2, 4, 5, LD	Luminance (Y): 1 Vp-p/75 ohms Chroma (C): 0.285 Vp-p/75 ohms	

Output

Output jack		Sensitivity	Impedance
VIDEO	VIDEO 1, 2, 3, MONITOR	1 Vp-p	75 ohms
S-VIDEO	VIDEO 1, 2, MONITOR	Luminance (Y): 1 Vp-p/75 ohms Chroma (C): 0.285 Vp-p/75 ohms	

Audio section

Input

Input jack	Sensitivity	Impedance
PHONO	2.5 mV	50 kilohms
TUNER, TAPE 1,2, VIDEO 1, 2, 3, 4, 5, LD, TV, CD.	200 mV	50 kilohms

Output

Output jack	Output level	Impedance
TAPE 1, 2, VIDEO 1, 2, 3	150 mV	470 ohms
MONO	100 mV	10 kilohms
CENTER	350 mV	2 kilohms
HEADPHONES	3 mW/ 8 ohms	Accepts low and high impedance headphones.

Equalizer
FRONT: BASS (100 Hz) ±10 dB
TREBLE (10 kHz) ±10 dB
CENTER: BASS (100 Hz) ±10 dB
MID (1 kHz) ± 6 dB
TREBLE (10 kHz) ±10 dB
REAR: BASS (100 Hz) ±10 dB
TREBLE (10kHz) ±10 dB
Surround
E.R. Time (HALL, STADIUM):
0 to 90 ms at interval of 3 ms
E.R. Time (THEATER, JAZZ CLUB):
0 to 51 ms at interval of 3 ms
Effect Level: 11 steps (0 to 100%)
Delay Time: 15 to 30 ms
at interval of 3 ms
Rear Level: 10 to −60 dB, −∞,
at interval of 1 dB
Center Level: 10 to −60 dB, −∞,
at interval of 1 dB
Input balance: Automatically adjusted

General

Power requirements
120V AC, 60 Hz
Power consumption
260 W
AC outlets 2 switched, total 300 W max
1 unswitched, 300 W max.
Dimensions Approx. 470 × 165 × 430 mm (w/h/d)
(18½ × 6½ × 17 inches)
including projecting parts and controls
Weight Approx. 17 kg (37 lb 7 oz)
Supplied accessories
Remote commander RM-P651 (1)
Sony Batteries SUM-3 (NS) (2)
Screws (8)

Design and specifications are subject to change without notice.

Specifications (Model for Other Countries)

Amplifer section

Power output (6 ohms, at 1 kHz)
Front: 120 W + 120 W
Center: 120 W
Rear: 40 W + 40 W

Continuous RMS power output*
Front: 70 W + 70 W (6 ohms, 20 Hz—20 kHz, THD 0.03%)

Harmonic distortion at rated output*
Less than 0.03%

Intermodulation (IM) distortion at rated output*
Less than 0.03%

Frequency response
PHONO: RIAA equalization curve ±0.5 dB
TUNER, CD, TAPE 1, 2, VIDEO 1-5, LD, TV: 10 Hz-100 kHz $^{+0}_{-3}$ dB

Residual noise* Less than 90 μV (A)

Damping factor 50 (8 ohms, at 1 kHz)

S/N TUNER, CD, TAPE 1, 2, VIDEO 1-5, LD, TV: 92 dB (A)
PHONO: 76 dB (A)

(*Source direct: ON)

Video section

Input

Input jack		Sensitivity	Impedance
VIDEO	VIDEO 1, 2, 3, 4, 5, LD, TV	1 Vp-p	75 ohms
S-VIDEO	VIDEO 1, 2, 4, 5, LD	Luminance (Y): 1 Vp-p/75 ohms Chroma (C): 0.285 Vp-p/75 ohms	

Output

Output jack		Sensitivity	Impedance
VIDEO	VIDEO 1, 2, 3, MONITOR	1 Vp-p	75 ohms
S-VIDEO	VIDEO 1, 2, MONITOR	Luminance (Y): 1 Vp-p/75 ohms Chroma (C): 0.285 Vp-p/75 ohms	

Audio section

Input

Input jack	Sensitivity	Impedance
PHONO	2.5 mV	50 kilohms
TUNER, TAPE 1,2, VIDEO 1, 2, 3, 4, 5, LD, TV, CD.	200 mV	50 kilohms

Output

Output jack	Output level	Impedance
TAPE 1, 2, VIDEO 1, 2, 3	150 mV	470 ohms
MONO	100 mV	10 kilohms
CENTER	350 mV	2 kilohms
HEADPHONES	3 mW/ 8 ohms	Accepts low and high impedance headphones.

Equalizer
FRONT: BASS (100 Hz) ±10 dB
TREBLE (10 kHz) ±10 dB
CENTER: BASS (100 Hz) ±10 dB
MID (1 kHz) ± 6 dB
TREBLE (10 kHz) ±10 dB
REAR: BASS (100 Hz) ±10 dB
TREBLE (10kHz) ±10 dB

Surround
E.R. Time (HALL, STADIUM): 0 to 90 ms at interval of 3 ms
E.R. Time (THEATER, JAZZ CLUB): 0 to 51 ms at interval of 3 ms
Effect Level: 0 to 100% (11 stpes)
Delay Time: 15 to 30 ms at interval of 3 ms
Rear Level: 10 to −60 dB, −∞, at interval of 1 dB
Center Level: 10 to −60 dB, −∞, at interval of 1 dB
Input balance: Automatically adjusted

General

Power requirements
220V AC, 50/60 Hz

Power consumption
260 W

AC outlets
2 switched, total 300 W max.
1 unswitched, 300 W max.

Dimensions Approx. 470 × 165 × 430 mm (w/h/d) (18½ × 6½ × 17 inches) including projecting parts and controls

Weight Approx. 16.4 kg (36 lb 2 oz)

Supplied accessories
Remote commander RM-P651 (1)
Sony batteries SUM-3 (NS) (2)
Screws (8)
AC plug adapter (1)

Design and specifications are subject to change without notice.

Troubleshooting

Before proceeding through the check list below, first refer back to the connection and operating procedures. Should any problem persist after you have made these checks, consult your nearest Sony dealer.

	Trouble	Possible Cause
General	Power cannot be turned on.	• Check if the power cord is disconnected from the power outlet.
	No function.	• Disconnect the power cord, and then connect it again. While pressing the SET button, turn on the POWER switch to reset the unit. (See page 5).
Audio	No audio.	• Check for faulty connection. (See pages 6 to 11.) • Check for SPEAKERS buttons are set to OFF (□). • Check for short-circuited speaker terminals. • Check that the input selectors are correctly selected. • Check if the MUTING button has been pressed; the indicator is lit. (See page 21.) • Check if the CENTER OFF mode is selected in the Dolby Pro Logic mode. (See page 17.)
	No sound or sound at very low level is heard from rear speakers.	• Check if the SURROUND MODE selector is set to off; no indicators are lit. (See page 27.) • Check if the volume level of the rear speakers are set to minimum. • Check if the monaural program source is played back in Dolby surround mode. • Check if the 3 CH LOGIC mode is selected in the Dolby Pro Logic mode. (See page 17.) • Check if the SOURCE DIRECT button is set to off; the indicator is not lit.
	No audio from one channel.	• Check if the BALANCE control is set an extreme position. • Check if the speaker cord or connection cord is disconnected.
	Distortion audio.	• Check if the audio volume setting is above the maximum permissible input of the speakers.
	Obscure instrument positioning, which lack of bass sound.	• The speaker connections are not correct. —The connections should be made with the "+" to "+" and "−" to "−".
	Hum or noise.	• Check that the grounding wire of the turntable is connected securely. • Check that the connection cords are inserted securely into jacks.
Video	No video	• Check that the connections are correct. (See page 7.) • Check that the input selectors are correctly selected.
	Unclear video, low image quality.	• Check if there is any nearby source of noise.
Programmable Commander	Remote-control operation cannot be performed.	• Check that the batteries are loaded correctly. (See page 15.) • Check if there is any obstacle between the programmable commander and amplifier. • Check if the batteries are exhausted. • Check if the mode selector is set to USER STD in remote-control operation using programmed signals. (See page 31.)
	The remote-control signal cannot be programmed. The LEARN indicator does not light.	• Place both remote commanders apart from the source of noise. • The batteries are exhaused. (See page 31.)
	The LEARN indicator goes off after flashing.	• The internal memory capacity is full. (See page 31.)